PATENT
450117-03033

AMENDMENTS TO THE CLAIMS

Please amend the claims without prejudice, without admission, without surrender of subject matter, and without any intention of creating any estoppel as to equivalents, as follows.

In the Claims:

Claims 1-73 (Cancelled)

Claim 74 (Currently amended)

74. A substrate structure for neurite outgrowth, comprising:

- a basic substrate, ~~wherein said substrate structure further comprises~~
- an alignment layer on said basic substrate, and a mono- or multi-layer of liquid crystal material on said alignment layer;
- or, alternatively, a combined alignment layer on said basic substrate ~~structure comprises on said basic substrate;~~
  - ~~a combined alignment layer,~~ wherein said combined alignment layer includes a liquid crystal, and ~~comprising~~ said combined alignment layer further comprises polymeric material selected from the group consisting of polyester, polypeptide, polyacrylamide, polyvinylalcohol, polyacrylate, polymethacrylate, polyurea and polyamide, or ~~said combined alignment layer comprising~~ at least one type of azosilane,

- wherein said substrate structure for neurite outgrowth has at least one neuron on top of said mono- or multilayer of liquid crystal material, or on top of said combined alignment layer, ~~and wherein said combined alignment layer includes a liquid crystal~~,

- wherein the orientation of the alignment layer or the combined alignment layer, and thereby the direction of neurite outgrowth, can be controlled and changed during the growth process of the neuron.

Claims 75 (Previously Presented)

75. The substrate structure according to claim 74, wherein said basic substrate comprises a glass substrate.

Claims 76 (Previously Presented)

76. The substrate structure according to claim 75, wherein said glass substrate is covered with a conductive layer or an electrode arrangement.

Claim 77 (Previously Presented)

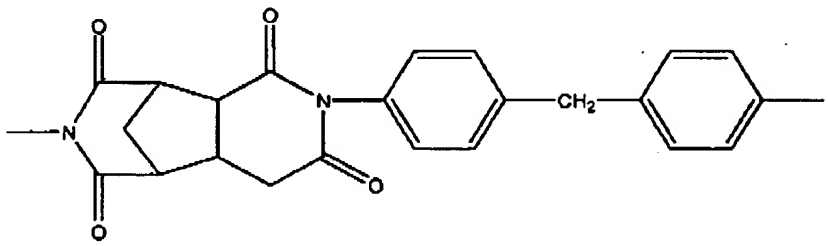
77. The substrate structure according to claim 76, wherein said at least one alignment layer is a polymeric alignment layer.

Claim 78 (Previously Presented)

78. The substrate structure according to 76, wherein said at least one alignment layer is a polyimide.

Claim 79 (Previously Presented)

79. The substrate structure according to claim 78, wherein said polyimide is represented by the following repeat unit:



Claim 80 (Previously Presented)

80. The substrate structure according to claim 74, wherein said liquid crystal material is 4-Octyl-4-biphenyl carbonitrile and/or 4-Pentyl-4-biphenyl carbonitrile.

Claim 81 (Previously Presented)

81. The substrate structure according to claim 74, wherein said at least one alignment layer has a thickness from 10 to 200 nm.

Claim 82 (Previously Presented)

82. The substrate structure according to claim 74, wherein said at least one alignment layer has a thickness of about 100 nm.

Claim 83 (Previously Presented)

83. The substrate structure according to claim 74, wherein said liquid crystal material has a thickness from 10 to 150 nm.

Claim 84 (Previously Presented)

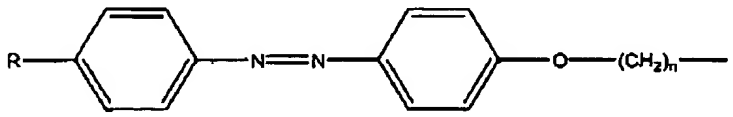
84. The substrate structure according to claim 74, wherein said liquid crystal material has a thickness of about 100 nm.

Claim 85 (Previously Presented)

85. The substrate structure according to claim 74, wherein that said polymeric material has at least one azobenzene chromophore covalently attached thereto.

Claim 86 (Previously Presented)

86. Substrate structure according to claim 85, wherein said azobenzene chromophore is represented by the formula:



wherein R is selected from the group consisting of CN, NO_2, OCH_3, H, CH_3, $(CH_2)_3CH_3$, F, Cl, Br, CF_3, C_6H_5, $O(CH_2)_2OCH_3$ and $(CH_2)_5CH_3$, and wherein n is selected from the range: $0 \leq n \leq 12$.

Claim 87 (Previously Presented)

87. The substrate structure according to claim 74, wherein said polyester is a side chain liquid-crystalline polyester.

Claim 88 (Previously Presented)

88. The substrate structure according to claim 87, wherein said side chain liquid-crystalline polyester is an azobenzene side chain liquid-crystalline polyester.

Claim 89 (Previously Presented)

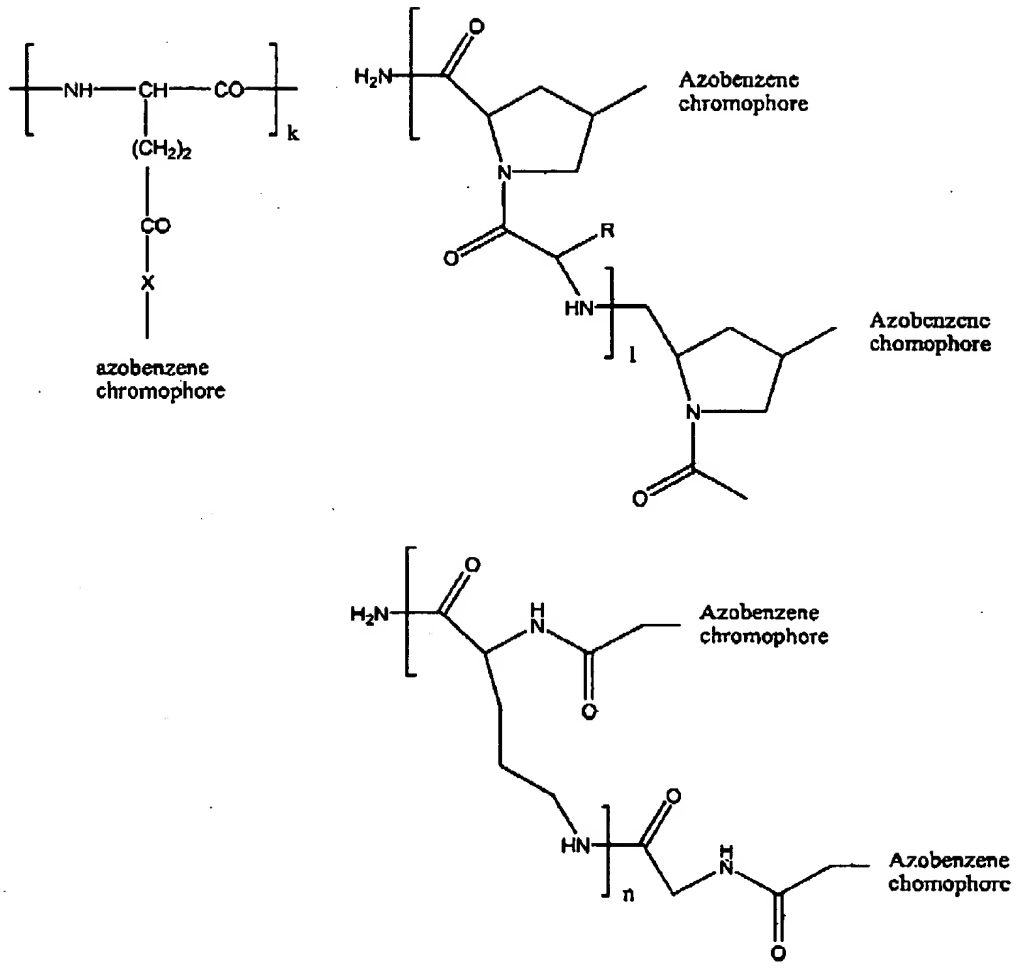
89. The substrate structure according to claim 88, wherein said azobenzene side chain liquid-crystalline polyester is a Pxnm-polyester selected from the group consisting of P6a12, P6a10, P8a10, P10a10, P8a12 and P10a12, wherein x is a para-substituent, n is the number of methylene groups in a flexible side chain spacer and m is the number of methylene groups in an acidic part of a main chain.

Claim 90 (Previously Presented)

90. The substrate structure according to claim 74, wherein said polypeptide is selected from the group consisting of polyglutamate, polyproline and polyornithine.

Claim 91 (Previously Presented)

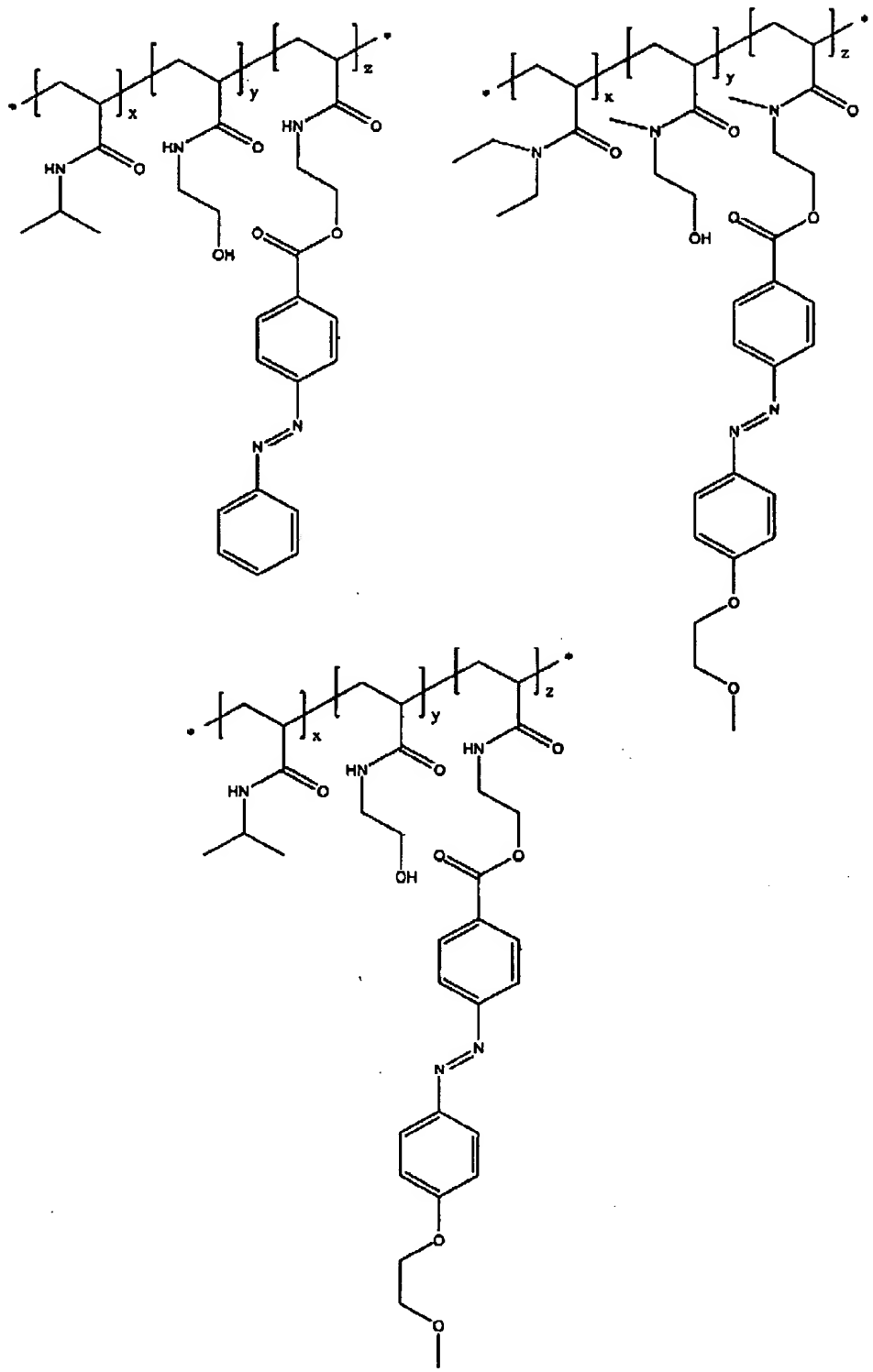
91. The substrate structure according to claim 90, wherein said polypeptide is selected from the group consisting of:



wherein X is selected from the group consisting of NH and O, the azobenzene chromophore is defined as in claim 86, and wherein k, n and 1 are selected from the range: $1 \leq (k \text{ or } 1 \text{ or } n) \leq 500$.

Claim 92 (Previously Presented)

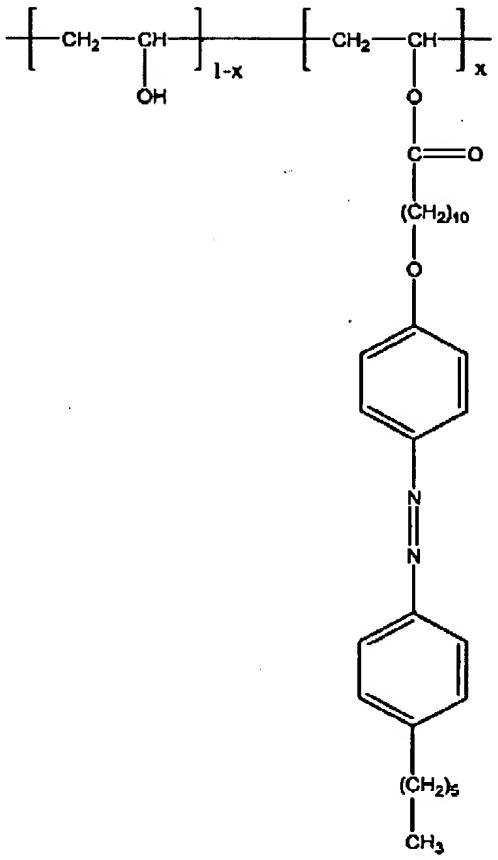
92. The substrate structure according to claim 74, wherein said polyacrylamide is selected from the group consisting of:



wherein x is selected from the range: $0.2 \leq x \leq 1$, y is selected from the range: $0.1 \leq y \leq 1$, z is selected from the range: $0.005 \leq z \leq 0.025$, and $x + y + z = 1$ for all combinations of x. y and z.

Claim 93 (Previously Presented)

93. The substrate structure according to claim 74, wherein said polyvinyl alcohol is selected from the group consisting of:

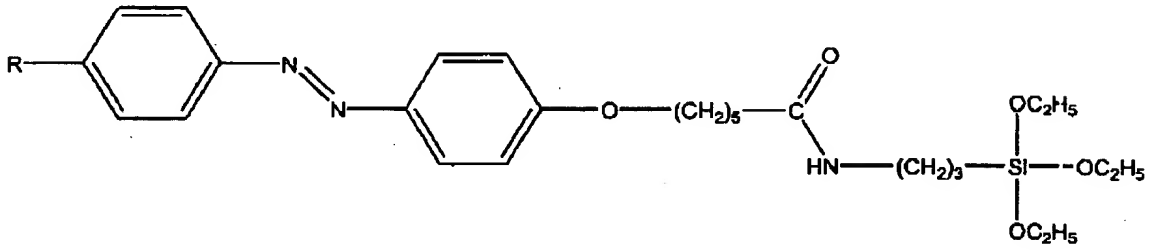


wherein x is selected from the range: $0.2 \leq x \leq 0.6$.

Claim 94 (Cancelled)

Claim 95 (Currently Amended)

95. The substrate structure according to claim 74 ~~94~~, wherein said at least one type of azosilane is of the formula:



wherein R is selected from the group consisting of CN, NO_2, OCH_3, H, CH_3, $(CH_2)_3CH_3$, F, Cl, Br, CF_3, C_6H_5, $O(CH_2)_2OCH_3$ and $(CH_2)_5CH_3$.

Claim 96 (Previously Presented)

96. The substrate structure according to claim 74, wherein said combined alignment layer has a thickness of 20 nm to 350 nm.

Claim 97 (Previously Presented)

97. The substrate structure according to claim 74, wherein said combined alignment layer has a thickness of 200 nm.